Issue 53
December 2023

Utah Valley Amateur Radio Club

The UVARC Shack

Club meetings

Lily Stice KK7PBS and Tyler Costaldo KK7OYP (above) discovered that UVARC is not your average ham radio club, and our meetings are not your typical club meetings. We don't read minutes of past meetings, announce financial reports, or make motions to vote on policies. We're active, upbeat, and celebrate and engage new hams. One major hallmark of each club meeting is an "eyeball QSO" in the first fifteen minutes, during which we merely mingle and get to meet people and answer questions. UVARC definitely has room for improvement, but we just want to go have fun.

In this issue of the *UVARC Shack*

Club meetings feature Railroad Radio Protocol and our DIY Night.

My Shack spotlights KG7WHX. *Amateurs in Action* in Wyoming. *Brass Tacks* on Switches.

Dear Annette on why sad hams are so sad and whether an amp qualifies for QRP. *Hot Tips* for operating outdoors, DIY for an inverted-L antenna. *The Amateur in You* on "partial-wave" antennas and having a backup plan.

Please send your ideas, stories, questions, gripes, and photos to ***uvarcshack@gmail.com***

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Club meetings

Recap

October 2023 club meeting – Railroad Radio Protocol

What an interesting presentation by Taylor Foote KI7SHU and friend Carson Casey of UTA's Front Runner! Carson explained the rigid protocol demanded of railroad workers and demonstrated a call (radio check) right in front of us. It's often enlightening to see and understand how other (besides amateur) services handle communication. By the way, in spite of the A/V problems that were plaguing us at the start, Taylor got it all figured out in time. You can see a recording of the meeting on this link, thanks to Trevor Holyoak AG7GX.

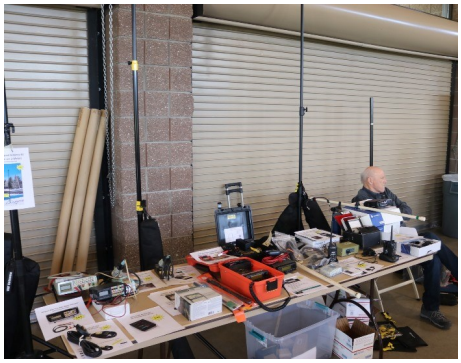
November 2023 club meeting – DIY Night

It was time once again for our annual DIY (do-it-yourself) Night, and once again it was a success. Many folks showed up to either share or learn a skill, such as soldering, antenna analysis, how to use a meter, and antenna building. It was also a chance for people to come and get questions answered, get their radios programmed (thanks, Ralph K7RLN!) or meet others in the club. The only complaint we heard was that it didn't last long enough, so we'll have to work on that. You can see a recording of the meeting on this link, thanks to Trevor Holyoak AG7GX.

By the way, many of our past meetings are recorded and posted on the club YouTube channel.

Utah Valley Swap Meet

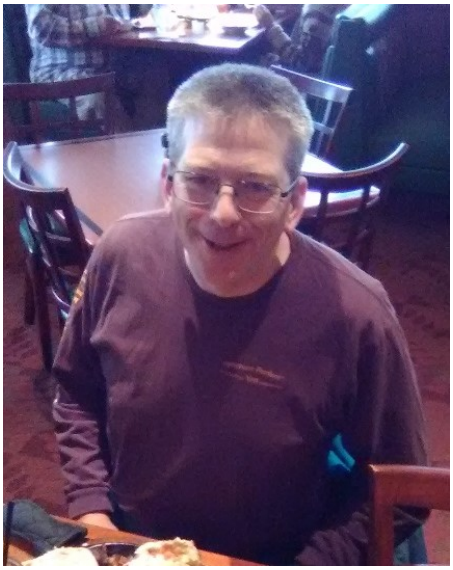
In photos



My Shack

Highlighting the shack (ham equipment and room) of a member, to give others an idea of the possibilities that might work for them

Scott Golightly, KG7WHX



My interest in radio started back in 6th grade when the principal in my middle school wanted to start a low-power AM radio station to broadcast the daily announcements as well as music at lunch time. Unfortunately, he was more enthusiastic about the project than was the school board, who refused to fund it. I had started studying for a radio license, and when I realized that wasn't really possible, I looked into amateur radio. However, I got scared off by the Morse code requirement and didn't really pursue it.

Over the years, I regained an interest and looked once more into amateur radio, but there was always that Morse code requirement, and I was busy with work and a family. When my children were older, and I found out that I didn't need to know CW anymore, I finally took a class and got my license. Since that time, I have studied for and earned my Amateur Extra license. I have also taken several CW academy classes and now regularly listen to CW.

I don't do much on HF because a wind storm blew down my mast about the same time I had a "medical incident" and it hasn't been a priority to get it back up in the air. I do enjoy supporting ultra marathons and bicycle races and usually get out to four or five events each year. To support those, I have steadily acquired a collection of 2-meter and 70-cm rigs. The main ones that I use are a Kenwood TM-D710GA, a Yaesu FT-857D, and a BTech UV-25X in my truck. I also have an FT-60R as my main HT, but have picked up some Baofeng HTs as good deals along the way.

I am mainly active in UCARES but also participate in TERT (Timpanogos Emergency Response Team) and UVARC as much as my schedule will allow. My favorite events are the ones where I can get out into nature and test my ability to transmit, and those where I am doing community service, like parades and fireworks.

I like getting on the radio and rag chewing, but now that I mostly work from home I don't talk as much as I used to. I have met some really great people whom I consider the salt of the earth through radio.

Scott currently serves as the Assistant Emergency Coordinator over Interface in UCARES (Utah County Amateur Radio Emergency Service).

- 73, Scott

Amateurs in Action

Recounts of ham radio operators who have used their effort and skills to help others in a time of need

Wyoming canyon rescue

Jim Shirey N7FC

It was just another day at the "office" for Nick Cashoili NØASL. A rolling office, that is. Nick is a truck driver from Nebraska, and on 31 October 2022, he was hauling a load through Crazy Woman Canyon in Wyoming. Not his favorite treat on this Halloween, a night of tricks; he would rather have been home dishing out goodies to the neighborhood kids.

Nick wasn't long into the canyon, when he slid off the road and was stuck. He was unharmed, but he knew things weren't good when he couldn't get a cell signal, so he reached for his ham radio and got into a local, county-owned repeater that's run by BARK, the local Buffalo Amateur Radio Klub.

Jim Shirey N7FC was sitting comfortably in his Buffalo, Wyoming, living room when he heard his HT come to life in the form of a distress call from Nick. *In any situation, immediately, the adrenaline starts pumping*, Jim said. *And you try to remember, in the training, what did we do? Because you haven't used it very often. You become very focused. It's intense. And, you know, it's not life or death, you're not there. But you can imagine their circumstance.*

Nick Cashoili NØASL

Jim called 911, and relayed pertinent details to dispatch, including Nick's condition and location. When first responders and sheriff's deputy arrived, Nick was rescued, and things returned to normal. But it wasn't until Shirey received a postcard in the mail a few days later from Nick that he learned Nick had actually made it out of the situation without a problem and was thankful for Jim's intervention.

From the time he wakes up until he goes to bed, Jim continuously monitors the repeater that BARK typically uses to communicate with its 20-plus members. *When it's all over with, you feel pretty good*, he said. *You feel kind of proud of yourself.*

You can read more about Nick and Jim's adventure in the *Buffalo Bulletin*, Wyoming Public Media, and the *Green River Star*.

New Hams and Upgrades

New hams

KO7RAD = Konrad Taotua
KK7OJP = Sarah VonClegg
KK7ONB = John Van Dorn
KK7OOS = Duane Butler
KK7OOT = Dale Cox
KK7OPC = Brian Nish
KK7OPH = Rhoda Cox
KK7OPV = Rebecca Adamson
KK7ORF = Brady Wall
KK7ORG = Annie Wilkinson
KK7ORH = Chad Snelson
KK7ORK = Nicholas Cutler
KK7ORL = Brynn Foote
KK7OVA = Andrew Clawson
KK7OXQ = Kyle Lundgreen
KK7OXY = Lee Hill
KK7OXZ = Sherri Hill
WA6KSF = Quinten Whitlock
KK7OYM = Mike Nehren
KK7OYP = Tyler Castaldo
KK7OYQ = John Nigliazzo
KK7OYW = Chelsea Wright
KØMEN = Nick Komen
KK7OZO = Carter Wilford
KK7PAE = Anne Teerlink
W7AVE = Paul Leck
KK7PBS = Lily Stice
KK7PEJ = Trifany Gibson
KK7PEM = Scott Worthington
KK7PFI = Grant Bawden
KK7PFK = Logan Nagata
KK7PFL = Thomas Wilkinson
KK7PFM = Mark Ommen
KK7PFQ = Daynia Leck
KK7PGA = Teresa Edwards
KK7PGQ = Gerri Pack
KK7PID = Dimitri Okhrimenko
KK7PMY = Rick Gardner
KK7PMZ = Ian Johnson
KK7PNF = Victor Dulude
AI7UB = Gregory Brown
KK7POC = Dakotah Bishop
KK7POD = Cameron Porcaro
KK7POX = Charles Coleman
KK7POZ = Grant Johnson
KK7PQC = Dana Swartz

Upgraded hams

KE7ZJD = Carole Lauridsen (Extra)
KG7IVT = Roland Henrie (General)
KK7IQA = Mark Lindsay (General)
KK7LBY = Samuel Merrill (General)
KK7MNK = James Olsen (General)
KJ7FUB = David Boucha (General)

Congratulations to all these diligent folks! We look forward to hearing you on the radio soon.

Events

Upcoming happenings

2023 Annual Christmas Potluck

Set aside the night of Thursday December 7th starting 6:00 pm, for the biggest potluck of the year, at the Orem Senior Friendship Center, 93 N 400 E. We've posted a sign-up sheet. The club will only supply the paper products, so we're looking for main courses, side dishes, desserts, drinks, and anything else you'd like to share with a dozen others.

Santa said he's also planning to be there to sample our goodies, so bring your little ones, to get photographed with Jolly ol' St. Nick himself. Seconds for those who get their photo taken on his lap.

We'll also have tables set up in back for you to show off your latest projects or newest purchases.

76ers Santa Net

The 76ers Santa Net tradition continues! The revered and long-anticipated net will take place on Saturday December 23 and Sunday December 24, at 6:00 pm on the 146.760 MHz repeater. Open to anybody, young or small, who wants to talk with Santa, but there must be at least one person at your station who is licensed.

To participate, simply bring your little ones to the radio, have them announce your call sign into the microphone when Santa asks for them, and when Santa calls for them, they can talk away at will. When they're done, they can say Thanks, give your call sign, and turn it back to Santa. No need for you to say anything, or intervene in any way, unless they're too young to do or say some of that.

Winter Field Day 2024

The Utah Valley Amateur Radio Club is planning to participate in Winter Field Day 2024 at the Lindon Marina, and all are invited. We plan to set up our stations as early as Friday January 26, but we'll actually be on the air, calling *CQ Field Day!* from noon Saturday January 27 through noon Sunday.

We'll need help setting up antennas, radios, and other parts of our three stations starting early Saturday morning. Afterwards, we'll need help taking it all down Sunday right at noon too. Please bring gloves. The club will provide dinner in the form of pizza and soft drinks between 5 pm and 6 pm Saturday January 27 inside or next to one of the RVs. All hams and their families are welcome to join the fun! This might be your opportunity to get on the air and make your first HF contact, even if you have no license. This is the link to the location. And this is the link to our Winter Field Day information page.

Ham Radio University

In 2022, we had a terrific time holding our monthly Ham Radio University. We were hoping to restart it in 2023, but it never materialized, because we just couldn't secure a consistently available location that wouldn't charge us a leg or an arm. Many have asked us about it, so this is just a note, to let you know that it's on our minds, and we're still considering options.

Events

Upcoming happenings

Brass Tacks

An in-depth look at a radio-related topic

Switches

When I enter my study, I flip a switch to complete a circuit that provides electrical power to the room light. Then, I sit down at my computer and press another switch to turn it on. After a minute of starting up, I move the mouse and press another switch, a mouse click. I then begin pressing a few dozen switches in the form of keys on my keyboard as I compose an email to somebody. When I click Send, the action starts the computer software into a series of operations that require the computer's central processing unit to turn millions of switches on and off in billionths of seconds.

The ***electrical switch*** is found nearly everywhere there's an electrical circuit; its primary purpose is to either complete or interrupt the path of electrical current. If the switch completes the electrical current path, we refer to it as being ***closed***, and if the switch interrupts the path, we refer to it as being ***open***. A switch is possibly the simplest electrical component to build or manufacture, but some switches can be very complex. Many are mechanical (have moving parts), like my light switch; many are not, like those in transistor circuits.

Switches are available in more types, styles, and varieties than probably any other electrical component. Perhaps the majority of mechanical switches in existence are used to complete a path for electrical power, but there are many that are used to connect other types of electrical pathways, such as the PTT (push-to-talk) button on your microphone or the keys on your computer keyboard. Note that this discussion does not include a Nintendo Switch. :-)

Poles and throws

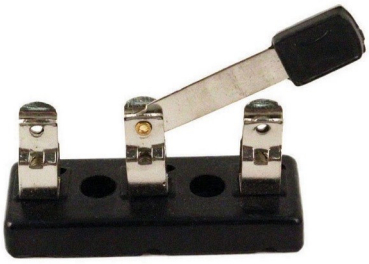
Picture, if you will, a knife switch that's being thrown to apply lightning energy to Dr. Frankenstein's monster or to somebody sitting in a chair at the Florida State Prison. The hinge of the knife switch is referred to as its ***pole***, like the point where a pole-vaulter might place the pole as an anchor point, to allow the athlete and the rest of the pole to swing up and over to the other side. The "swing" action of the knife switch making a contact is referred to as its ***throw***, like the pole action of the pole-vaulter *throwing* the athlete over the bar.

Brass Tacks

continued

Because the above knife switch has only one hinge point, we say that it's a ***single-pole switch***. And because the blade of the knife switch can only swing toward one side to make a contact, we say that it's a ***single-throw switch***. Together, we call this a ***single-pole, single-throw switch***, and we often abbreviate that to ***SPST***.

Of course, a switch can have a single pole, or a single point of electrical source, but can swing two ways, making contact on one side or the other. We therefore call this a ***single-pole, double-throw switch***, which we abbreviate to ***SPDT***. A switch can have two points of contacts, so that it can provide an electrical signal from two sources, so we call this a ***double-pole switch***. You can imagine the many switch types that can be made from the combinations of poles and throws.



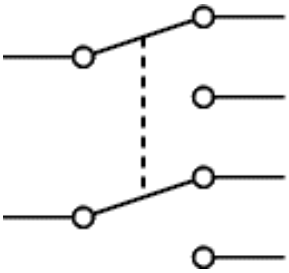
SPDT switch

DPST switch

DPDT switch

TPDT switch

In these knife switch varieties, you can see that the DPDT switch, for example, is simply made of two separate SPDT switches, only the two "knife blades" are permanently attached to each other, such that they always swing or throw together. We say that the two switches are ***ganged*** (they "gang" up), meaning that a single physical operation results in affecting multiple circuit paths.



DPDT switch symbol, ganged connection dotted

Making and breaking

My base station radio is normally powered by a power supply that's plugged into the wall socket. Yet if my house power goes out, in under a minute I can easily unplug my radio from the power supply and plug it into a battery. Even better, I can connect a DPDT switch, whose poles are connected to my radio, and whose one side pair is connected to the power supply and the other side pair is connected to the battery. When I throw the switch, I've now reduced the time that the radio switches its electricity source from commercial power to battery power from under a minute to a few seconds.

This way, because I **break** the connection with the power supply before I **make** the connection with the battery, we call this operation ***break-before-make***, the most common type for physical switches. It allows two different circuits to remain completely isolated during the switching process. But even a few seconds means my radio will be turned off, then turned on again, interrupting what I'm hearing, or even disrupting my transmission.

Instead, I might prefer to somehow switch from one power source to another one without turn-

Brass Tacks

continued

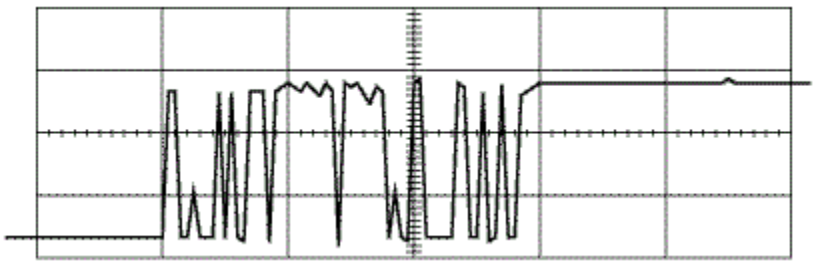
ing off the power to my radio. That means I momentarily **make** the connection to my battery before I **break** the connection to my power supply. Therefore, this type of switch operation is known as ***make-before-break***, which allows my radio to run *continuously uninterrupted*. Its main disadvantage, of course, is that the two power circuits come in contact with each other for a very short period of time, which needs to be taken into consideration during design.

Most UPS (uninterruptible power supply) units use the make-before-break operation to switch between commercial power and battery power and provide the continuous, uninterrupted electrical energy they're known for. Obviously, this can become a life-saving feature for medical equipment or even entire hospital wings. It's also used by a *transfer switch*, which allows a home to switch between commercial power and generator power or solar power almost unnoticeably.

Switch bounce

When a physical switch closes, the contacts don't always connect smoothly because they're made of actual materials, typically a metal. If you were to observe this connection microscopically and in very slow motion, you'd likely see the contacts touch, then rebound off each other, then touch again, repeating the cycle until they come into full contact, like a basketball repeatedly bouncing on the driveway until it rests on the concrete.

This undesirable action is known as ***bounce***, and can wreak havoc on a circuit that depends on a constant voltage level. If the switch is connected to the input of a logic circuit, for example, its signal could be interpreted as a 1, then a 0, then a 1, another 1, etc., until the switch stops bouncing. The result is a signal stream of random ones and zeroes (and indeterminate states!) in rapid succession, and can appear like the following on an oscilloscope:



Imagine what would result if this switch was flipped by a person at a voting booth : the candidate might get more than a dozen votes! Solving the problem of bounce requires a circuit that captures the first transition to the opposite state, and outputs a signal of that state until the switch has settled into its final state. We call that *switch debouncing*, and one popular, effective, and inexpensive device used for switch debouncing is the Schmitt trigger.

Ideal switch

Real-life switches seem nearly perfect for the functions they perform in many respects, but they exhibit limitations that sometimes need to be taken into account for specialized circuits. An *ideal switch* might be one that exhibits no voltage drop, zero rise and fall times, no bounce, no voltage or current limit, and zero resistance. For most applications, the non-ideal behaviors are negligible, and so produce no meaningful effect on the circuits or signals they

Brass Tacks

continued

attempt to connect.

But real-life physical switches bounce, have slightly oxidized contacts, and can only carry a finite amount of current. If you measure the resistance across two contacts of a new switch in its closed position, your meter might display a very low value, maybe something along the lines of 0.00005 ohms, if it's even capable of that fine of measurement.

After a few years of use, however, that same switch might read 2.1 ohms, 42,000 times the original value! Oxidation and carbon buildup due to arcing, oils spreading from internal joints, and environmental contaminants, such as dust, moisture, and microbes collect and partially interrupt the formerly clean path. The minimum amount of current required to overcome the oxidation is known as the *wetting current*. If the applied voltage is sufficiently high, this increase in resistance could result in warming the switch to the point of actually causing a fire, damaging not only the switch but whatever it's attached to, such as your house.

Circuit breaker

Somewhere in your house, an electrical panel contains a couple of columns of switches, each of which typically remains closed (connected) until an undesirable event triggers it to open. A *circuit breaker* is an automatically operated switch that permits current to flow through it until a threshold of current is reached, after which the switch is opened, "breaking" the home circuit to which it normally supplies the power. An ordinary circuit breaker will open if a current exceeding 10 amperes to 20 amperes appears on its household circuit.

A special case of a circuit breaker is the *GFCI breaker* which interrupts electrical power to an outlet in the event of an unbalanced flow of current between the "hot" and the "neutral" sides of the outlet. Electronics within a GFCI outlet can detect the unbalance to between 5 and 25 mA, and subsequently opens both the hot and neutral sides by an internal DPST switch.

If a person is using a home appliance that becomes wet, the amount of current that can electrocute the person is unlikely to cause an ordinary circuit breaker to open. In a GFCI outlet, however, the small amount of current routed from the hot side of the outlet will be detected as different from that of the neutral side, resulting in the breaker interrupting the power to the outlet. In the US, GFCI outlets are required within one meter of any sink in all new homes today.

Electronic switch

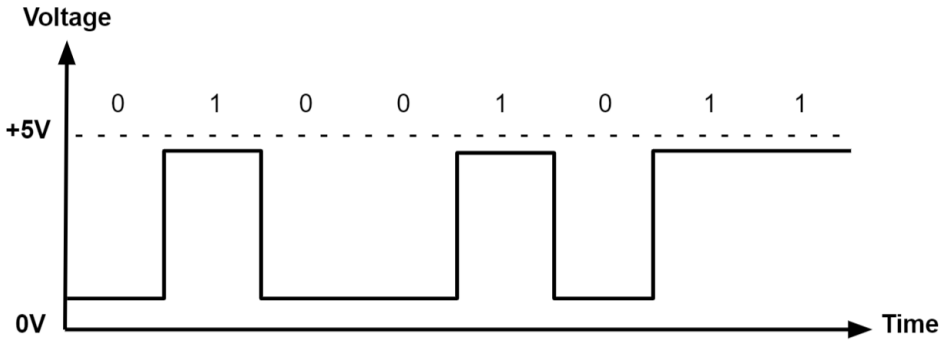
Also called a *solid-state switch*, an *electronic switch* is one that is made of, or controlled by, an active electronic component, such as a transistor, an operational amplifier, or similar solid-state circuit. A unique feature of an electronic switch is the lack of physically moving parts. An outdoor motion detector, for example, can apply voltage to a transistor, which can control whether a camera starts taking a video of the person or animal whose motion was detected.

An electronic switch works on the principle that power to a circuit can be turned on or turned off "sufficiently"; that is, it can switch between a high-impedance state and a low-impedance state. This means, even when the solid-state switch is turned "off", power to the circuit might

Brass Tacks

continued

still be applied, but the current that flows into the circuit is considered negligible in the intended application. For example, inside a computer CPU (central processing unit) chip, numerous transistors constantly switch on and off (to each represent "one" or "zero"), but their "off" states are not "power turned off" states. (Note that this is unrelated to CPU P-state and C-state conditions, which affect the power source of the CPU as a whole.)



As you can see from the above digital logic state voltage diagram for, say, the output of a logic gate, the "low" voltage ("zero" bit) doesn't quite go down to zero volts. This non-zero voltage results in some minor *leakage current* between logic gates, but is within the acceptable region considered by the gate as a "zero" and does not affect gate function.

Common switches

The staggering number of switch varieties make a complete catalog here impractical, if not impossible. This brief and abbreviated list describes the most common switch types in use today, some listed by their primary means of mechanical operation.

Slide switch

Light switch—household toggle switch used for lighting and appliances

Momentary switch—normally remains open until pressed, like a keyboard key or a microphone PTT button or mouse click button

Slide switch—slide the switch to one end or the other, like a power switch to an amplifier

Soft switch—physical switch that activates an electronic switch, like the rubber power switch on a mobile radio or a small kitchen appliance

Limit switch—small switch that is normally closed (connected) until something pushes on its lever, interrupting the power, like the small switch at the top of an elevator, to turn off its power when it reaches the top floor

Rotary switch—rotating selector switch that allows multiple connections in several positions

Isolation switch—allows a low-voltage circuit to control a high-voltage circuit, like with a relay

Touch switch—activates when capacitively contacted by a finger, like a smartphone screen

Environmental control switch—allows environmental conditions to apply electrical power to an appliance or device, like a thermostat, motion detector, or life support systems

Brass Tacks

continued

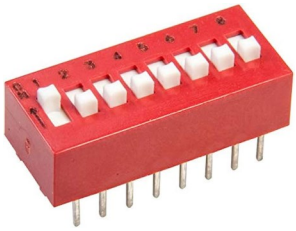
Special-use switches

Some switches possess rather unique operations or styles, and are manufactured for special uses and applications. Here's a short list of a few of them:

- Keyed (ignition, LOTO)
- Pull-cord (light, variable-speed fan)
- DIP (dual-inline-package, can be a series of SPST slide or flip switches)
- Three-way light switch
- Externally controlled (thermostat, timer, dead-man)
- Relay (electrically isolates circuits)

Finally

If you need to design a circuit that contains a switch, you'll also have to consider a number of factors to help you make the right choice. Not all of them are important in every case, but some might be, for specific applications. Here are a few to keep in mind:



DIP switch

- Maximum voltage
- Maximum current
- Numbers of poles and throws
- Style (flip, rocker, slide, DIP, flat, toggle, push-button, knob, pull-cord, touch)
- Type (momentary, limit, rotary, dimmer, knife, isolation)
- Texture and tactility (membrane, touch, capacitive)
- Weather protection

Summary

A switch is an electrical device that's typically used to complete or interrupt a pathway of electrical power to one or more electrical circuits. Switches exist in numerous types; in fact, possibly more than any other electrical component. A switch can be a mechanically activated device, or it can be solid-state, in which there are no moving parts. The output of a mechanical switch must be debounced, if its signal is to be used as an input to a logic circuit. There are a number of switch features to consider when designing a circuit that uses one. Many switch types can be found redundantly listed in multiple groups, due to functionality, purpose, and design.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

Dear Annette

What's on your mind? Serious, humorous, technical, and thoughtful answers to your deepest, (mostly) ham-related questions.

Dear Annette:

I've heard that ladder line makes a better feedline than coax for HF. So, should I use ladder line for my dipole instead of coax?

Robert in Indianola

Dear Robert:

Ladder-line will work well for you as a low-loss feed line, but how to bring the end into your shack without coupling to nearby objects has been a long-time struggle for many who have tried. Unlike coax, you'll need to keep parallel-line away from anything conductive, like your aluminum siding, gutter, downspout, shed, fence, and window frame. In the end, coax tends to be much simpler and more cost-effective, in spite of its loss, which on most HF frequencies is quite low for RG-8X and LMR-400.

Dear Annette:

Why are sad hams the way they are? I mean, their attitude and treatment of other hams have been the cause of why many good people have left the hobby.

Andrew in Orem

Dear Andrew:

In amateur radio, you might find that many of these people who belittle, criticize, or otherwise mistreat other hams don't even realize they're doing wrong, simply because of the culture in which they were raised. In fact, many of those "sad hams" will read your question and agree with you, inwardly saying, *I'm sure glad I'm not one of them!*

Dear Annette:

Is it still QRP if I connect my QRP rig to an amp?

Kent in Orem

Dear Kent:

An interesting question! According to the ARRL definition for QRP (low-power operation), it's 5 watts CW PEP and 10 watts SSB PEP. On one hand, that "PEP" could be power measured at the transmitter output, which is at your transceiver, and which will allow you to attach an amplifier to increase that to legal limit. On the other hand, the word "output" could actually mean "feed line input" which means the amplifier would be limited to 5 watts on CW. Either way, if your feed line attenuates the signal by 3 dB, for example, but terminates at an antenna that exhibits 12 dBd in a particular direction, then those 5 watts of CW can turn into $5 \times 2 \times 2 \times 2 \times 2 \div 2 = 40$ watts ERP in that direction. I personally interpret the *spirit of QRP* as being a total of 5 to 10 watts into your feed line, making your amplifier a little pointless.

Dear Annette:

If I replace my 25W 2 meter mobile rig with a 50W version, will that make much of a difference?

Rock in Saratoga Springs

Dear Rock:

Increasing your 2-meter transmit power can indeed make a difference, especially to a station you're attempting to reach that's barely receiving you or if your signal isn't quite opening their squelch. For others, not so much. (When they hear you "cutting in-and-out" that's often their squelch level set very close to their detection of your signal level.)

Got a question for Dear Annette*? Email it to* ***uvarcshack@gmail.com*** *and include your town name. Sorry, no guarantees.*

The Amateur in You, Part 1

What have you been pondering?

Partial-wave antennas

When people talk about ham radio antennas, they often seem to mention a *quarter-wave antenna* or a *half-wave antenna*, and so forth. Will a *full-wave antenna* work? How about a *double-wave antenna*? It turns out that there are good reasons for using what I call a *partial-wave antenna* (a term I made up) over an antenna that's a full-wavelength long or longer.

Wavelength

In free space, radio signals travel the speed of light. We can calculate the wavelength of the signal if we know its frequency, because the relationship is speed of light = frequency times wavelength, or

sol = freq x wl, or **wl = sol ÷ freq**

in which "sol" means "speed of light" and "wl" means "wavelength". For example, a 146 MHz signal has a wavelength of

wl = sol ÷ freq

wl = 300 Mm/s ÷ 146 = 2.055 m

Velocity factor

Let's consider a simple wire that we might use for an antenna at a particular frequency. (We refer to that wire as an ***antenna element***, and can be other types of conductors too.) If we connect a signal source, like a radio, to that wire, it'll take some time for the signal to travel the length of the wire, typically slower than the speed of light. If the wire is made of copper, the signal travels in the wire at about 95% the speed of light, so we say that the wire has a ***velocity factor*** of 0.95.

Full-wave antenna

Even though one wavelength of a 146 MHz signal in free space is 2.055 m long, in a copper wire it's 2.055 m x 0.95 = 1.954 m. This way, a copper wire that's 1.954 m long is *one wavelength long* for 146 MHz, and if we were to make an antenna from that 1.954 m-long wire, we'd say that it's a ***full-wave antenna*** at the selected frequency (146 MHz). Obviously, a ***double-wave antenna*** is made from an antenna element that is twice the length of a full-wave antenna.

Partial-wave antenna

If we were to cut the element wire of a full-wave antenna in half, we would say that it's a ***half-wave antenna*** at the same frequency. If we were to cut it in half again, you can see that it's now a ***quarter-wave antenna*** at the same frequency. So, I'm referring to any of these less-than-full-wavelength antennas as a ***partial-wave antenna*** for convenience.

Antenna resonance

A wire that's a multiple of a quarter-wavelength can be made into an antenna that is ***resonant*** at its target frequency; that is, its feed-point (where the coax connects to the antenna) impedance is purely resistive. A quarter-wave antenna and a half-wave antenna exhibit feed point impedances that are well within the ranges for typical amateur operation.

On the other hand, a full-wave antenna, while resonant, has a very high feed point impedance, making it essentially unusable for amateur operation. It's still possible to make use of a full-wave antenna by reducing its huge feed point impedance, which is the theory behind the design of a folded dipole, a delta loop, and other loop-type antennas that are full-wavelengths long.

Antenna patterns

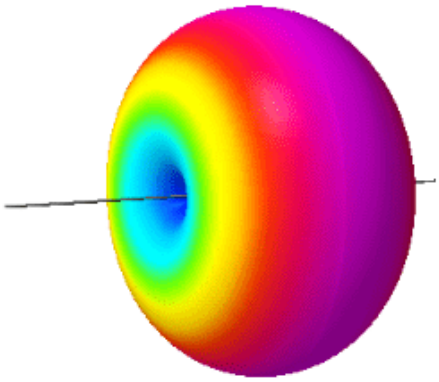
Another consideration for which antenna element lengths to select is ***antenna radiation***

The Amateur in You, Part 1

Continued

pattern, or simply *antenna pattern*, which is a two- or three-dimensional view of the relative strengths of signals radiating from an antenna in all directions. An antenna's pattern is determined by a number of things, including its height above ground, its proximity to conductive objects, and yes, its element lengths.

For example, a half-wave dipole antenna installed way up high and away from anything conductive will exhibit a pattern that resembles a large donut on its side, while a Yagi antenna contains a half-wave dipole that's got several nearby conductors called *parasitic elements*, which drastically affect its pattern from that of an ordinary dipole.



A quarter-wave antenna and half-wave antenna tend to produce a pattern that indicates their signals are emanated both effectively and efficiently. A full-wave antenna, on the other hand, produces many lobes in its pattern, indicating wasted signal in multiple directions. The same applies to a double-wave antenna.

Other partial-wave antennas

In the world of VHF radio, we often hear of a ***5/8-wave antenna***, whose elements are 5/8 of a wavelength long. That might seem like an odd fraction of a wavelength, but it's popular with VHF antenna manufacturers because it's effective, efficient, and easy to make. Several well-known mathematical antenna modeling software applications show that the 5/8-wave antenna is possibly the very best one for VHF because it possesses the most optimal balance between resonance, feed point impedance, and pattern, which includes gain.

Because the feed point impedance isn't perfect, however, the 5/8-wave antenna needs a ***counterpoise*** in the form of ***radials*** to help bring its impedance within a practical range. Will the same principles apply to an HF antenna? Yes, of course, but because their wavelengths are much longer, ground losses (including height above ground and soil conductivity) factor more significantly.

The ***7/8-wave antenna*** is another, though lesser-known, antenna designed primarily for VHF signals. It requires even more engineering than that of the 5/8-wave antenna to make it effective, including a special matching circuit. Its advantage is greater gain (more signal strength in its strongest direction), but at the cost of efficiency and feed point impedance.

Summary

A "partial-wave" antenna is one whose antenna element lengths are less than a full wavelength long with respect to a particular frequency, taking velocity factor into account. An antenna whose elements are multiples of one-quarter wavelength are resonant for a particular frequency. The quarter-wave antenna and half-wave antenna are useful because they are not only resonant, but exhibit a reasonable feed point impedance, something that is difficult for a full-wave antenna or double-wave antenna to achieve. Other partial-wave antennas exist in the amateur radio world, but are accompanied by their own challenges.

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The Amateur in You, Part 2

What have you been pondering?

Have a backup plan

Have you ever volunteered to help during a drill or an event, only to find that you have a dead battery or a broken antenna? On one hand, it's our goal to keep our preparation simple. On the other hand, it's often wise to have a ***backup plan***, or at least some idea of what equipment you can take with you, to fortify your existing gear.

What we're talking about are extra pieces of equipment that you might bring with you, over and beyond what you might already be taking. I suppose you can bring two of everything, and your backup plan will be complete, but is that reasonable? If not, here are some extra things you might want to consider collecting before heading out:

- Spare batteries or power supply and cords
- Additional pre-programmed radio
- Extra coax or pigtail
- Connectors, adapters, extenders
- Spare or better antenna
- Can of gasoline
- Spare headlamp
- Another hoodie for somebody else
- Spare gloves for another person

- Extra chair
- Hand microphone
- Pen and paper
- Alternate radio frequencies (simplex and repeater)
- Radio programming cable and laptop
- Umbrella (for rain or shine)
- Duct tape
- Extension cord
- Rope, string
- Different location or time
- People (operator, logger, helper)
- Footwear (shoes, boots)

As you can see, your backup plan doesn't have to be confined to ***your*** needs. Another person, maybe the one you're serving with, can use an extra hand at times too.

Finally

If the situation renders your activity ***unwise*** (competing activity), ***insensitive*** (death in the family), or ***unsafe*** (bad storm brewing), the best backup plan might be no plan at all. There's no shame in canceling an event, especially if moving forward with the activity might jeopardize people's well-being.

Hot Tips

Good info for the new ham, and old stuff to refresh your memory

Check the weather before operating outdoors

There might be a time when you'll want to leave the comfort of your home, and use your radio to help out with a drill, for personal hobby interest, or for an actual emergency. If you plan to operate your radio outside your home, maybe away from *any* permanent shelter, it's a good idea to check the weather forecast before venturing out there. You don't want to rush out and risk damaging your equipment by getting it wet or sunburned or worse; it would be good to know what awaits you.

It might seem obvious to glance outside your big picture window to get a good idea of what's happening currently, but there are a couple of things to consider. One is that you're viewing the weather in its *current* condition, and anybody who's lived in our area knows how quickly weather can change. Another is that not everybody has the luxury of a clear view of the weather from the living room, or any other room, for that matter. Many hams live in apartments or small living spaces that are surrounded by trees, tall fences, or buildings. So, simply looking outside is not always the best idea, but it's a start.

If possible, before going out, get online and check the forecast for the next few hours. If your internet is unavailable, then by all means go outside and get a look at the sky if it's daytime, and estimate which way the clouds are moving. Even at night, you might be able to get some idea of what weather to expect.

You might find out that the equipment you're so used to operating seems to work differently in the out-of-doors for one reason or another. One might be that your equipment can function differently under conditions of higher or lower temperature, greater humidity, or simply because your eyes are unaccustomed to the bright sunlight. Another is that wind, even a slight breeze, can make it difficult for others to hear you, as it whistles across your microphone. Finally, operating at an unfamiliar location can place you just a little out of your comfort zone, resulting in shivering, stammering, and occasional hesitation.

Because of the nature of our preparation-minded activities, it's ironic to think that the worse the weather is, the more likely our help might be needed. While we tend to experience good weather more often than adverse weather, the likelihood of a communication need seems to increase with the times storms roll through.

Besides creating a nuisance with your microphone, as I had mentioned, wind can easily tear down taps, canopies, and tents, and overturn tables, chairs, and small vehicles, like wagons and bicycles. If you know that you'll be out in a windy condition, bring extra rope, and brush up on your knot-tying skills. Also, bring several bottles of water, because the wind tends to quickly dehydrate us humans.

By the way, if you suspect there'll be lightning coming your way, being outside is not a very good idea; remain indoors, if at all possible. If you must go outside in a lightning storm, stay away from trees, ponds, lakes, hilltops, and mountain ridges. When you hear thunder, the best place for you to be is inside.

So, the bottom line is that operating our equipment outdoors can be fun and different, but it has its challenges. So, ***use good judgment*** and check before going out there, and make sure it's safe for both you and those operating with you.

DIY

Worthwhile projects you can build on your own

The inverted-L Rybakov 806 antenna

The what? I've been looking for a good inverted-L antenna design that I could build, and happened upon this version, which seems to have not only operator testimonials but technical data to support them. An inverted-L antenna is simply a vertical monopole (and therefore end-fed) antenna that's bent over somewhere near the middle, so that the bent-over part is at a right angle with the vertical portion and horizontal with the Earth. The advantage of an inverted-L is the ability to support 80 meters using a vertical orientation (complete with a low take-off angle) without being forced to make it stand 60 feet straight up.

This particular design is patterned after one by Craig La Barge WB3GCK and called "Rybakov" meaning "fisherman" in Russian, and named that because it resembles an operator who's fishing for contacts, and in fact can be erected by a common fiberglass fishing pole for the vertical portion. The "806" designation simply refers to the fact that it supports 80 meters through 6 meters, which I'm hoping to prove.

Your coax connects to a 4:1 unun of an alternate design from the one I've showcased in another article. The other side of the unun is attached to the radiating element, which runs straight upward for 26 feet, then straight outward for 27 feet. Because it's an end-fed antenna, it's heavily dependent on a good ground connection for its performance and matching close to around 200 ohms. The unun then transforms the impedance down to 200 ÷ 4 = 50 ohms for most frequencies, and your internal tuner can handle the rest.

Parts list

One toroidal T-200-2 ferrite core

56 feet 14 AWG stranded wire

One 4.7″ x 3.2″ x 2.6″ enclosure

Four 14 AWG #8 stud ring terminals

Six inches of RG-8X coaxial cable

Two #8 screws, wing nuts, washers, split washers

Two dogbone insulators

One ground lug

One SO-239 bulkhead connector

42 inches of 22 AWG zip wire

One 1-½″ x 3/16″ eye bolt

One 14 AWG #4 stud ring terminal

Four each M3 screws, split washers, nuts

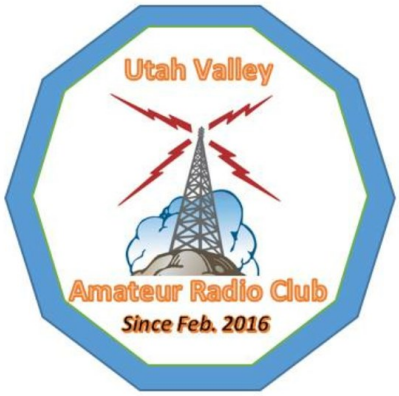
One 2-½″ x 2-½″ fiberglass screen

Zip ties, Super Glue™, heat shrink tubing

One 28-foot telescoping fiberglass pole

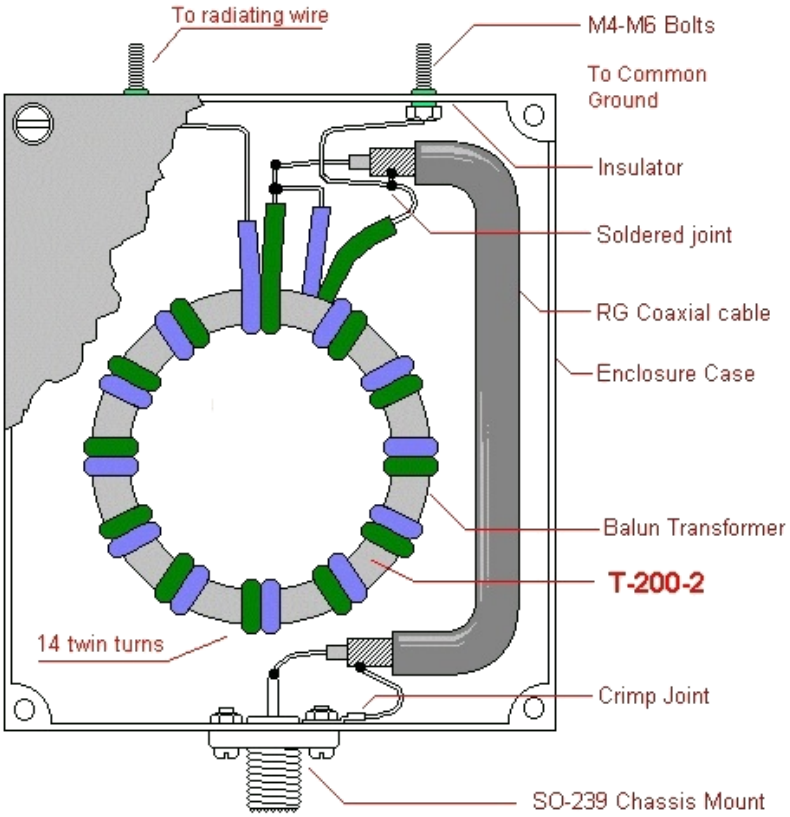
DIY, continued

Inverted-L Rybakov antenna



Coil assembly

The diagram to the right shows what we're trying to accomplish. The purposes of this design are to a) maximize common-mode current reduction, b) minimize losses, while c) maintaining a 50-ohm impedance transformation on the transceiver side of the unun d) for a wide range of frequencies e) on 100 watts of transmit power.

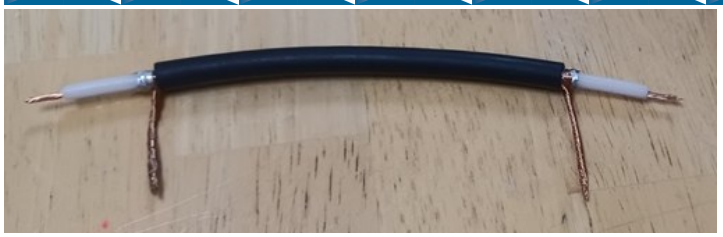


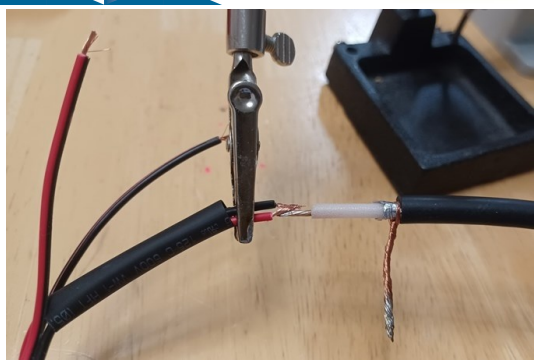
Tightly wrap 14 to 18 evenly spaced turns of the 22 AWG zip wire around the toroidal core, leaving about four inches extra on each end. For reference, our red wire corresponds to the blue wire in the diagram, and our black wire to the green. Secure both ends against the toroid with zip ties, then strip all four wires. Also strip both ends of the six-inch RG-8X coax, making sure to leave enough dielectric (clear) insulation to keep about an inch of separation between the center conductor and the braid on each end.

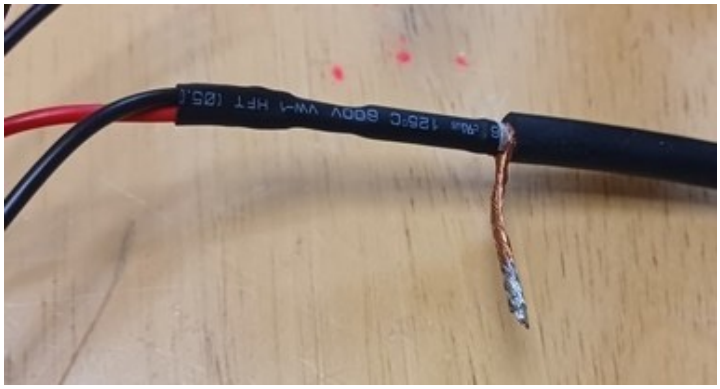
Slip a piece of heat shrink tubing over the black wire on the left side and the red wire on the other side, then solder the two wires together with the center conductor of the antenna end of the six-inch coax. Apply the heat shrink tubing over the junction. Slip another piece of heat shrink tubing over the coax braid, then solder the black wire and the coax braid onto a #8 ring terminal. Apply the

DIY, continued

Inverted-L Rybakov antenna

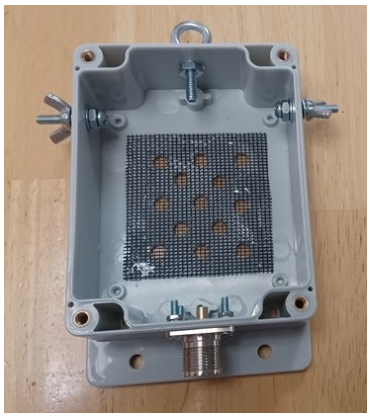






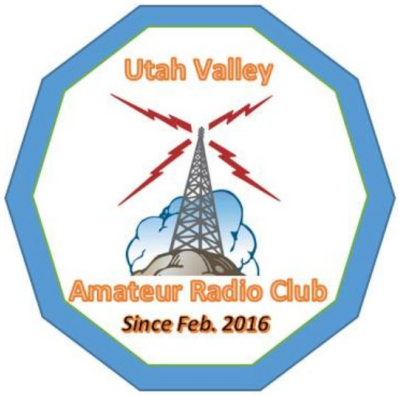
heat shrink tubing over the braid. Solder the red wire to another #8 ring terminal. Solder the coax braid of the transceiver end to a #4 ring terminal.

Enclosure assembly



Drill a 9/16″ hole in the enclosure at one end I'll call the unun bottom. Place the solder cup end of the SO-239 bulkhead into the 9/16″ hole on the outside of the enclosure, and using the four mounting holes of the bulkhead as a template, drill a 1/8″ hole for each mounting hole. Assemble the bulkhead onto the enclosure using the M3-0.5 mm hardware.

Drill eleven to fourteen ¼″ holes in the back of the enclosure, for ventilation. Cover the holes by super-gluing the fiberglass screen over them on the inside, to prevent insects and debris from entering the enclosure.



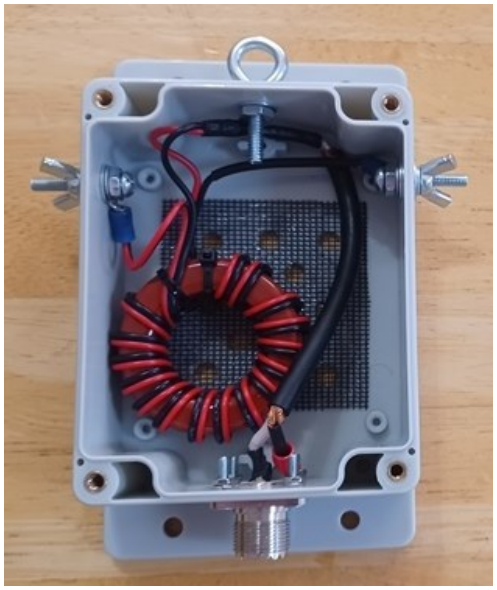
DIY, continued

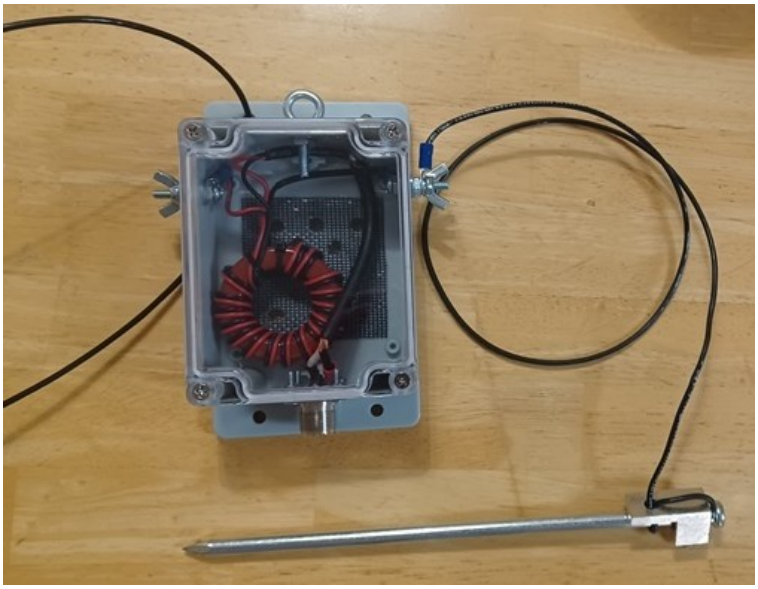
Inverted-L Rybakov antenna

Drill a 3/16″ hole in the unun top, about ¾″ from the back of the enclosure. Install a flat washer onto a 3/16″ eyebolt, and slip the eyebolt assembly through the hole. Secure the eyebolt with another flat washer and a nut. This eyebolt can be used to hang the unun and relieve some of the strain on the wire elements due to the weight of the unun and the coax.

Drill two 3/16″ holes on opposite sides of the enclosure about an inch below the unun top (the end opposite that of the bulkhead connector) and about 1″ from the back of the enclosure. Slip a #8 machine screw through each ring terminal, then tighten a nut onto the screw to hold the terminal in place. Slip each the assembly through the side hole from the inside of the enclosure. On the outside of each assembly, apply another flat washer, lock washer, and wing nut.

Plug a PL-259 connector into the SO-239 bulkhead, for a heat sink. If you don't plug in a connector, soldering the cup in the rear of the bulkhead can get hot enough to melt the dielectric, especially if you're using a low-wattage (under 60 watts) soldering iron. Slip a piece of heat shrink tubing over the unfinished end of the six-inch coax center conductor, solder the center conductor to the center post of the SO-239 bulkhead connector, then apply the heat shrink tubing. Bolt the #4 ring terminal of the braid to one of the M3-0.5 screws of the bulkhead.





Secure the coil to the inside of the enclosure, if you'd like. Install the enclosure cover, and the unun construction is complete.

Grounding, wiring, and counterpoise

Attach a 12-to-30-inch wire to the ground (right, in our case) side by a ring terminal. Connect the other end to a ground stake by a ground lug like this: Strip that end about ¾″ long, and tin the end. Unscrew the ground lug and insert the ground stake into the large hole, with the lug flange pointing away from the stake head. Insert the tinned wire into the mounting hole on the side away from the stake, route the wire around the stake and back out the mounting

DIY, continued

Inverted-L Rybakov antenna

hole, then insert the tinned wire into the same large hole behind the stake, opposite the large screw. Tighten the screw, and the stake and tinned ground wire will be bonded together.

Attach 53 feet of 14 AWG stranded wire to the antenna (left) side. I used #8 ring terminals for both wires, leaving a couple of inches for a strain relief on each of them. Slide a dogbone insulator onto the 53-foot wire, and bend the wire at 26 feet from the unun, and temporarily secure the insulator at that spot, which will be the "elbow" of the upside-down "L" in the antenna. Slide another dogbone insulator onto the 53-foot wire, and secure it at 27 feet after the first insulator.

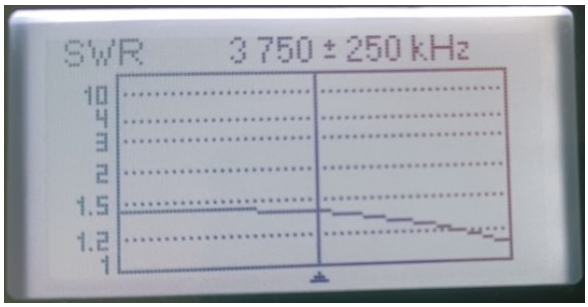
Ground lug and stake and wire detail

Testing the antenna

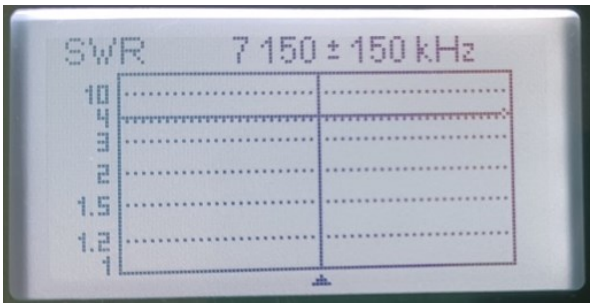
Secure the center dogbone insulator and a paracord guy wire to the fishing pole, then erect the pole. Secure the end dogbone insulator to a tree or other tall structure. Connect the coax between your transceiver and the unun. Drive the ground stake almost all the way into the dirt.

To first test the inverted-L Rybakov antenna, I wanted to play around with the height and the tuning, without worrying about the flimsiness of the fiberglass pole. So, I set up two 28-foot military masts fifty feet apart on my front lawn. That gave the antenna plenty of isolation from the metal, yet allowed for the 26 feet of height.

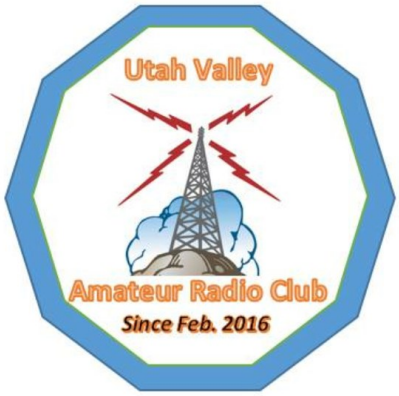
The antenna tuned really well on 15 meters, 20 meters, and 80 meters, but not so well on 40 meters. I tried modifying the tuning and matching by adding radials, first a pair of 33-foot wires, then a pair of 66-foot wires, then both. I discovered that the more radials I added, the worse became the tuning, and they didn't seem to help with performance. My antenna seemed to work best with no radials at all. Here are some analyzer results:



80 meters with a wide bandwidth

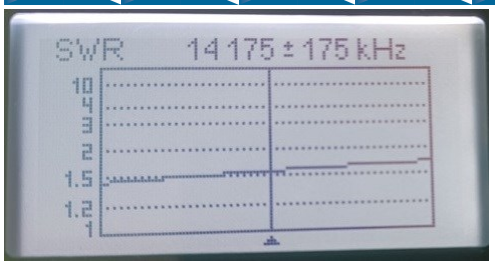


Disappointing 40 meters

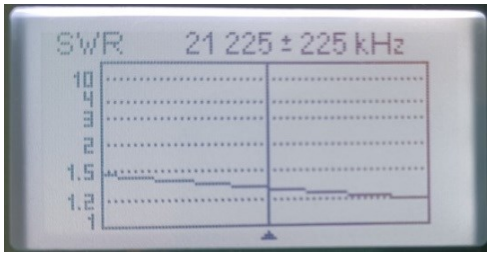


DIY, continued

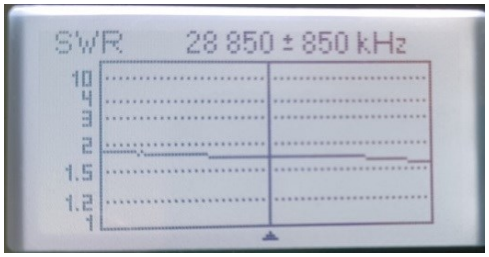
Inverted-L Rybakov antenna



20 meters



15 meters



10 meters

I connected the coax between the antenna and my Icom IC-718, and right away I noticed that this was a terrific *receive antenna*. It was able to bring in a lot of signals on 20 meters and 40 meters, which were the most active bands on the night I finished constructing the antenna. Even 40 meters tuned easily with my external tuner. I didn't have room to show them here, but the analyzer also displayed good SWR response on 6 meters, 12 meters, and surprisingly, 2 meters!

While listening around, testing on 20 meters, I heard a loud, clear signal whose operator spoke with an accent, so I attempted to make a contact, in spite of the pileups. It was a guy named Adrian TI7ØRC from Costa Rica, and it took three attempts, but he finally acknowledged my call sign, so he became my first contact with my inverted-L Rybakov antenna. (BTW, Adrian confirmed the contact on QRZ a week later.)

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Living in the Past

Historical perspective

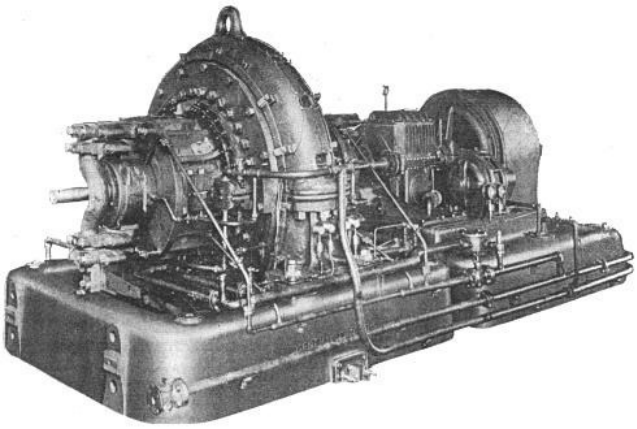
RF transmission by alternator

After the turn of the 20th Century, it was known by radio pioneers such as Reginald Fessenden that a continuous wave (CW), rather than a spark, was needed to transmit voice wirelessly. The problem was that oscillators of the day could only produce audio-frequency waves, which were not very helpful in getting radio signals go very far. In 1904, Fessenden approached General Electric for help, and Swedish-American engineer employee Ernst Alexanderson took on the challenge of generating a *radio frequency continuous wave signal*.

In 1906, Ernst devised a way to generate high-frequency signals by creating a very fast-turning electric generator he termed an *alternator*, indicating its purpose of producing alternating current. The first one created by him delivered power at 50 kHz, a remarkable breakthrough into the greater-than-20 kHz signal barrier. The next one delivered 75 kHz, which Fessenden used for his transmitter, to make the first AM radio entertainment broadcast on Christmas Eve 1906, and could be heard by Naval ships and shore stations down the US East Coast.

As Ernst continued to develop the alternator, the machine became widely installed as a transmitting station for commercial industry and the military. It was difficult to install one aboard small shipping vessels, due to its large size and weight. By the 1930s, the Alexanderson alternator was relaced by the smaller and much more cost-effective vacuum tube oscillators and transmitters.

Ernst Alexanderson was also a part-pioneer in the development of television. As part of an experiment, he was the first to receive a television signal, from his Schenectady, New York, home in 1927. The following year, Ernst developed the technique of coordinating audio with television images while working for RCA.



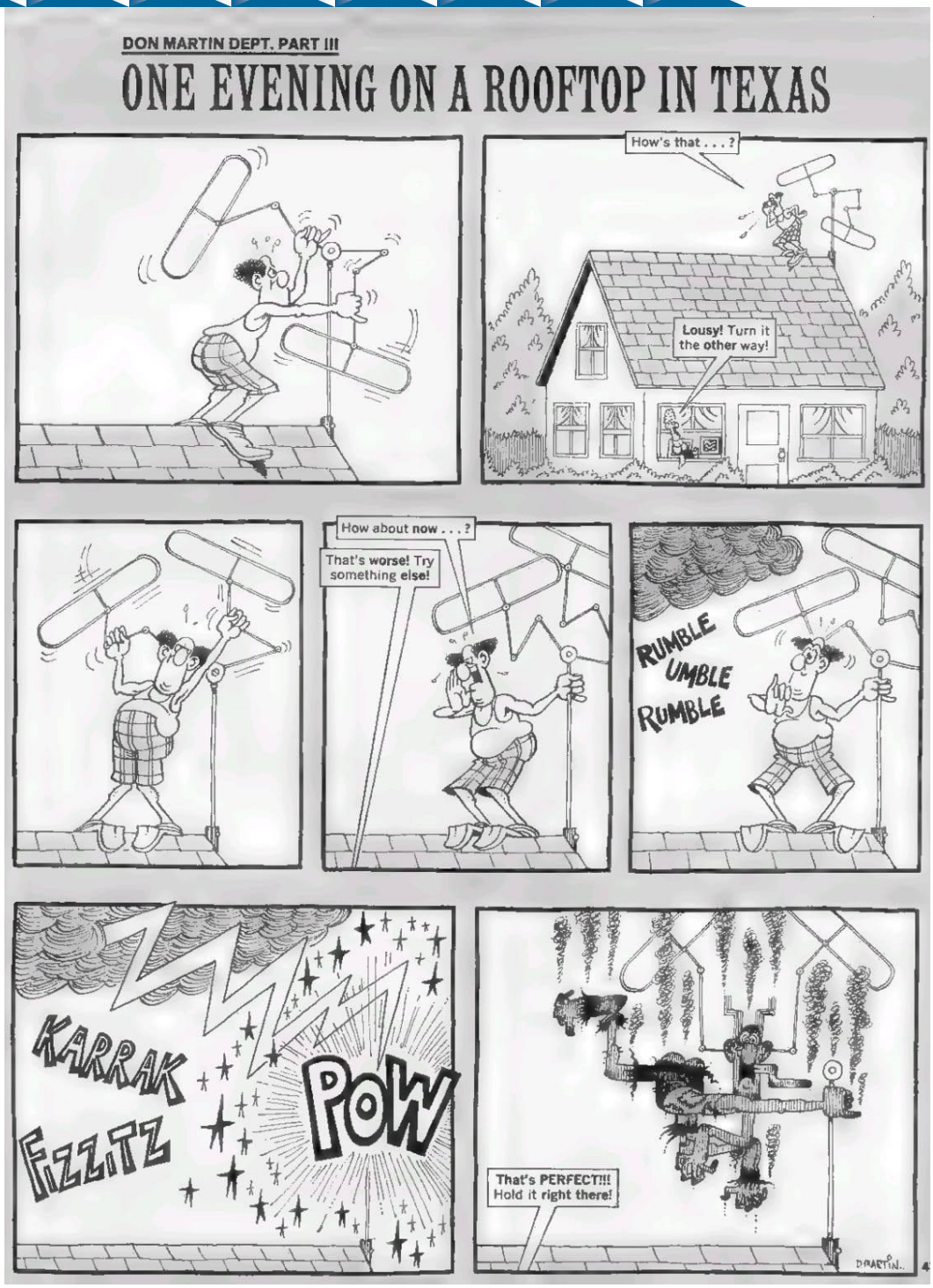
Alexanderson alternator

In 1923, Ernst's son Verner was kidnapped, and he announced the incident by broadcasting an appeal for help over radio. Three days later, the child was found safe, and the kidnappers were caught. This was possibly the first radio call for help (and possible forerunner of the AMBER alert?) for a missing or abducted child.

Ernst once developed a DC (direct current) amplifier, for which he received a patent. Over his lifetime, Ernst Alexanderson had received 345 US patents, the last filed in 1968 at age 89.

Side of Bacon

A little ham humor



For Your Insight

Information you could use

Club meeting format

Here's the usual agenda for club meetings, at the Orem City Council Chamber Room, 56 N State St:

Talk-in frequency on the club repeaters

6:30 pm : Eyeball QSO

socialize / put faces with call signs

radio programmers available to help you

6:45 pm : Call the meeting to order

meeting lineup (agenda)

announcements / calendar / new hams

7:00 pm : Discussion / presentation

7:45 pm : Door prizes

7:55 pm : Dismiss and disassemble

8:00 pm : *Club QSY* to a local eatery

Something you'd like to see at the meetings?

Thanks to Heath Stevenson for making our monthly meetings possible!

Monthly meeting help

We're grateful for the volunteers who help with various tasks that make our club night just that much more friendly and useful to everybody. Monthly, we need help with

programming radios (thanks, Loren / Ralph!)

taking photos or videos during the meeting (thanks, Joe!)

setting up tables and chairs (thanks, Heath!)

Lynx

Websites for your education and leisure

Ham Radio Equipment
Ham Radio Nets
Radio Programming
Complete ham radio education
Net Training Topics
76ers Group and UVARC Group pages
New Ham Page

*Send your input to **uvarcshack@gmail.com***

Test your knowledge

General and Extra review (answers next page)

G8AØ7 : Which of the following phone emissions uses the narrowest bandwidth?

A. Single sideband
B. Double sideband
C. Phase modulation
D. Frequency modulation

E2CØ7 : What is the Cabrillo format?

A. A standard for submission of electronic contest logs
B. A method of exchanging information during a contest QSO
C. The most common set of contest rules
D. The rules of order for meetings between contest sponsors

Calendar

What's happening
(times are Mountain Time)

Provo Ham Exam Sessions

Provo Fire Station #2, 2737 N Canyon Rd

Sign up at HamStudy.org/sessions/nv7v

Sat 16 Dec, 2:30 to 5:00 pm
Wed 20 Dec, 7:00 to 8:00 pm
Wed 17 Jan, 7:00 to 8:00 pm
Sat 20 Jan, 2:30 to 5:00 pm
Sat 17 Feb, 2:30 to 5:00 pm
Wed 21 Feb, 7:00 to 8:00 pm

*Email **uvhamtest@gmail.com** for info*

Provo One-day Technician Courses*

Third Saturday Monthly at 8:00 am

Provo Fire Station #2, 2737 N Canyon Rd

** September through April*

2024 Orem Ham Radio Courses

Sign up at psclass.orem.org

Technician : Jan 23, 30, Feb 6, 13
General : Mar 19, 26, Apr 2, 9
Extra : Jul 16, 23, 30, Aug 6, 13
Technician : Sep 17, 24, Oct 1, 8

Club Meeting Calendar (6:30 pm)

On YouTube Live, and Facebook Live

December 7*	January 4
February 1	March 7
April 4	May 2

† *Ham Radio Fair, Pheasant Brook Park*

** 6:00 pm at the Orem Friendship Center*

Regular Nets

UVARC Family Net, Sun 3:30 pm, 146.780
NE UC ERC Net, 1st Sun 9 pm, 147.540 (s)
Health & Fitness Net, Mon 7 pm, 146.780
UVARC Ladies' Net, Tue 7 pm, 146.780
DMR Utah Net, Wed 6 pm, TG 3149, CC 1
Utah 76ers, Wed 7 pm, 146.760
UVARC HF Net, Wed 9 pm, 28.345 / 7.220
UVARC New Ham Net, Thu 7 pm, 146.780
CERT Ham Net, 2nd, 4th Thu 8:pm, 146.780
Utah County 6-meter Net, Fri 8 pm, 50.140
Family History Net, Sat 8 pm, 146.780
See a larger list of nets at noji.com/nets

Upcoming Contests

ARRL 10-meter Contest
5 pm Fri Dec 8 to 5 pm Sun Dec 10

ARRL Kids Day
11 am to 5 pm Sat Jan 6

North American QSO Party (NAQP)
11 am to 11 pm Sat Jan 20

Winter Field Day
Noon Sat Jan 27 to noon Sun Jan 28

See a larger list at contestcalendar.com

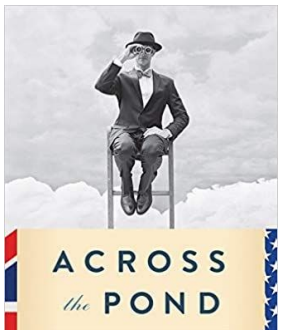
Answers to *Test your knowledge*

G8AØ7 : **A** (Single sideband)

E2CØ7 : **A** (A standard for submission of electronic contest logs)

Across the Pond

That is, the Utah Lake 'pond'



Eagle Mountain ham radio activities

A list of amateur radio activities near Eagle Mountain, organized primarily by Dave Becar KI6OSS. Unless otherwise noted, all these activities will be held at the Eagle Mountain City Hall, 1650 Stagecoach Run. Please contact Dave at **ki6oss6365@gmail.com** to register for any of the classes or exams, for any additional information, or questions in general.

February 2024 Technician Course

Thu 01 February, 7 to 9 pm
Thu 08 February, 7 to 9 pm
Thu 15 February, 7 to 9 pm
Thu 22 February, 7 to 9 pm
Thu 29 February, 7 to 9 pm

Ham Radio Exam Session

Sat 02 March 10 am
Open to all, for any license class

April 2024 General Course

Thu 04 April, 7 to 9 pm
Thu 11 April, 7 to 9 pm
Thu 18 April, 7 to 9 pm
Thu 25 April, 7 to 9 pm
Thu 02 May, 7 to 9 pm

Ham Radio Exam Session

Sat 04 May 10 am
Open to all, for any license class

May / June 2024 Technician Course

Thu 23 May, 7 to 9 pm
Thu 30 May, 7 to 9 pm
Thu 06 June, 7 to 9 pm
Thu 13 June, 7 to 9 pm
Thu 20 June, 7 to 9 pm

Ham Radio Exam Session

Sat 22 June, 10 am
Open to all, for any license class

September 2024 Technician Course

Thu 29 August, 7 to 9 pm
Thu 05 September, 7 to 9 pm
Thu 12 September, 7 to 9 pm
Thu 19 September, 7 to 9 pm
Thu 26 September, 7 to 9 pm

Ham Radio Exam Sessions

Sat 21 September, 10 am (Swap Meet)
Sat 28 September, 10 am
Open to all, for any license class

Ham Radio Nets

Eagle Mountain ECT Net
Sundays, 9 pm 147.220+ MHz (151.4 Hz)

Eagle Mountain Chimney Rock Stake
Sundays 8:30 pm 446.500 (s)

Eagle Mountain Central Stake
Saturday 8 pm 145.650 (s)

Vendors

For your convenience

Pockrus Joystick J-pole

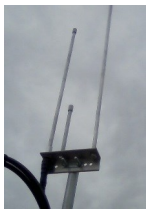
$30, open-stub aluminum half-wave, dual-band J-pole antenna

$40, 6-meter dipole, $20 for the 220 MHz (1.25 m) antenna

by Carl Pockrus, WE7OMG (email omgantennas@gmail.com to order)

Half-wave performance, solid construction, weather-proof, low wind-load

Probably the best-performing outdoor antenna you can get for the price



Super-Elastic Signal Stick

$20, vertical quarter-wave flexible antenna

by Richard Bateman, KD7BBC, of *SignalStuff* (and maker of *HamStudy*)

Super-performing antenna for your HT (handhold transceiver)

Visit SignalStuff and select SMA-Male, SMA-Female, or BNC

Ham Radio Podcasts v1.50

by Trevor Holyoak, AG7GX (email android@holyoak.com)

Stream podcasts (such as *100 Watts and a Wire*, *Amateur Radio Newsline*, *ARRL Audio News*, etc.) or download for later listening

For Android 4.1 and up (ad-free available for purchase)

Club Logo and Call Sign Embroidering

Want your call sign or name (or both!) embroidered on your shirt, your hoodie, your duffle? Or how about a club patch with your call sign?

by Glenna Gardner, WE7SEW (glenna0354@gmail.com or text 801-592-2503)

Call sign or name = $5, Both = $8, UVARC patch = $5, Patch with call = $9

Portable Aluminum J-pole

$60, sectioned, open-stub aluminum half-wave, dual-band J-pole antenna

by Stan, KJ7BDV and Kent, N7EKF (email skantenna@yahoo.com for info or call 801-372-7260)

Complete antenna breaks down into a compact 2″ x 6″ x 12″ package weighing only 3 lbs, perfect for backpacking and portable work where you really need a good 2-meter antenna

HamBadgers

Amateur radio name badges and other products

$10, official UVARC ham radio name badge with the club logo

Visit Ham Badgers and select Ham Radio Clubs > Utah Valley Amateur Radio Club

Email Eric Palmatier at hambadgers@gmail.com or call 919-249-8704

Where everybody knows your call sign

Utah Valley Amateur Radio Club
PO Box 1288
Orem, Utah, 84059-1288 USA

K7UVA
Phone/Text: 801-368-1865
Email: k7uva@arrl.net

Repeaters: 146.780–, 100.0
448.200–, 100.0 224.560–, 100.0
145.250–, 100.0 448.225–, 100.0
Newsletter input?
Email uvarcshack @ gmail.com
Need help?
Email uvarcelmer @ gmail.com

[See all our newsletters on uvarc.club]

We are the *Utah Valley Amateur Radio Club*, a 501(c)(3) non-profit (EIN 81-360-6416) Utah corporation that was organized in an obscure Orem fire station on 02-05-2016 to provide amateur radio enthusiasts in Utah County and surrounding areas a way to gather and discuss all things ham. Our primary purposes are to provide a local amateur radio resource, help new hams in their new-found adventures, and to give more experienced hams a reason to share their wealth of knowledge and wisdom in a friendly atmosphere of fellowship. We're an ARRL Affiliate and work in cooperation with the Utah VHF Society, but are not subsidiary to them, to ARRL, ARES, or any other organization, although many of our members and leaders might also belong to the same.

This newsletter is copyrighted and published by the Utah Valley Amateur Radio Club, and its purpose is to convey the tone and temperament of the club, to inform and entertain its members, and to entice the rest. To join, go to uvarc.club/join, then sign up at www.facebook.com/groups/uvarc/ to stay informed. For more information about our club or about amateur (ham) radio in general, please email or text or call us.

More than just a club, we invite you to become part of a great ham radio movement in Utah Valley

Our fearless leadership

Presidency

President..... Noji Ratzlaff
Vice President..... Chad Buttars
Secretary.....Caryn Alarcon
Activities..... Michele Costello
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Brad Kirk, AF7FP
Alma Perry, W1ZGY
Loren Chandler, WB1KE
James Brown, W7JHB
Harry English, AA1HE

Club Sponsor

Heath Stevenson, KK7KOU
Orem City Emergency Manager

From all of us to you, 73

Braden Heath, son of Robert Heath W7XEF, won the handheld transceiver door prize, and says that has inspired him to start studying for his license.

Stan W2STN at his antenna table explains his setup and wizardry to Steve K7WON